



ADVANCED WINDOWS

Bluetooth

Bluetooth should make it easy for electronic devices to communicate with each other wirelessly, yet many people have problems with the technology. Simon Edwards explains how to avoid the Bluetooth blues

Bluetooth lets you connect wireless gadgets together to create your own personalised network of devices, but not all products work together well. In this article, we'll get to the bottom of why some people have a great time using Bluetooth while others have nightmares.

Bluetooth is appearing in increasing numbers of gadgets, including handheld computers, global positioning system (GPS) receivers and mobile phones. The recent rash of Bluetooth-borne mobile phone viruses is evidence that Bluetooth is a mainstream technology. Usually, a technical standard makes it in the consumer market only when it is stable and error-free. Sadly this is not the case with Bluetooth, as a number of variables can create problems.

The most common cause of Bluetooth blues is the Windows driver software that comes with the adaptors and other devices. We'll discuss the main differences between the available options and show how to change drivers to get the best performance. It is possible to use Bluetooth devices without a PC being involved. For example, you might want to use a Bluetooth headset with a mobile phone, or synchronise your contacts between a handheld computer and a phone. However, many people will want to link their PCs to their personal devices. For example, you can back up phone numbers to a PC, upload emails to a phone and access a broadband internet connection using a PDA.

To enable Bluetooth you need an adaptor, which plugs in to the PC's USB port, PC Card or CompactFlash slot. Unless you have Windows XP Service Pack 2 (SP2), your PC will not support Bluetooth until you install special driver software known as a Bluetooth stack.

STACK SITUATION

The stack you use is an important consideration, and many Bluetooth users blame their technical problems on this set of drivers. Windows XP SP2

comes with Microsoft's own stack, which is fairly limited as it doesn't support every kind of Bluetooth device. It has been designed for transferring data to and from other devices, printing and connecting to Bluetooth modems (including mobile phones) to make dial-up networking connections.

If you want to transfer pictures from your camera phone, connect to the internet over a general packet radio service (GPRS) connection or print to a Bluetooth-enabled printer, the Microsoft stack is a solid choice. It will also allow you to use a Bluetooth mouse and keyboard. The Microsoft stack doesn't support audio devices, though, so if you want to use a Voice over IP (VoIP) service such as Skype using a Bluetooth headset, you'll need to install an alternative. For example, an application called SkypeHeadset (www.skypeheadset.co.uk) lets you control a Skype VoIP session using your Bluetooth headset controls. However, it works only with the Widcomm BTW Bluetooth stack.

Different stacks have different Windows interfaces, although they often seem similar on first glance. For example, the Microsoft, Widcomm and IVT stacks all place a small blue icon in the Notification area on the taskbar. But the Widcomm stack creates a My Bluetooth Places entry in My Computer; the Microsoft one does not. And if you right-click the Widcomm's small blue icon, you can access Advanced Configuration. This is not available with the Microsoft software, which is a shame as



▲ Bluetooth lets you connect phones, headsets and PDAs such as the Dell Axim X50v

it allows you to see the services that the Bluetooth device can provide to other devices, as well as services it can connect to on other devices.

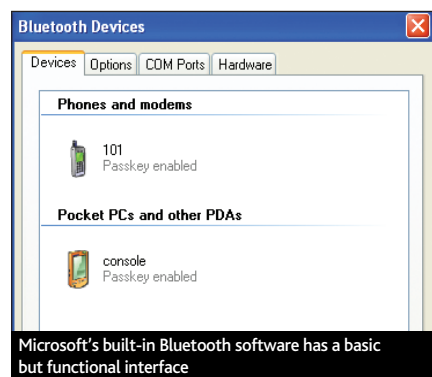
The IVT software is quite different from its competitors. It uses a control panel called BlueSoleil. The interface shows available Bluetooth devices orbiting an orange globe. The Toshiba stack uses a different Notification area symbol, which looks like a little black and green antenna. Both of these stacks are less common than the Widcomm one.

UNCUSTOMISED DESIGNS

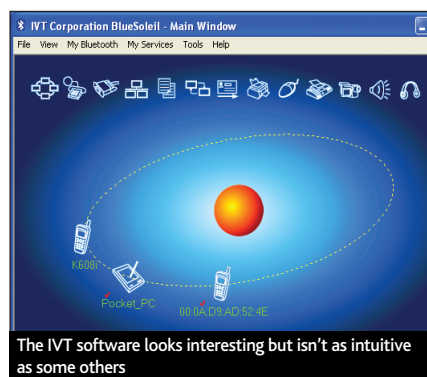
Ultimately, your choice of stack will be made for you, as it will be included on the installation CD that comes with the device. However, some cheaper devices might not have been properly customised, which can cause problems.

In addition to the Bluetooth stack, manufacturers should also customise the firmware on their devices. This is software built into adaptors, headsets, mice and so on. Some companies make cheap devices by installing the basic firmware without making any changes and including an unmodified stack. This can cause strange problems, such as a cheap Bluetooth adaptor appearing as a printer to other devices.

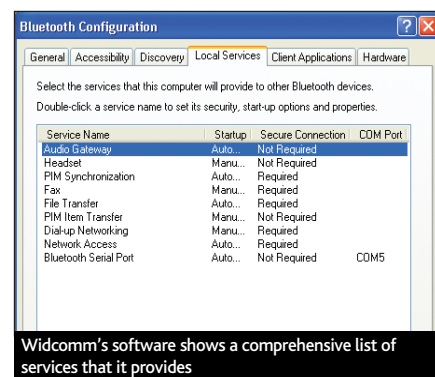
If you have problems such as this, you might be able to install another stack. If you have another Bluetooth device that came with a Widcomm installation disc, try installing it on the PC with the cheap Bluetooth device. This is a last resort, though, and only to be tried after attempting to get new drivers from the hardware manufacturer. Not every stack supports every Bluetooth chip. ➔



Microsoft's built-in Bluetooth software has a basic but functional interface



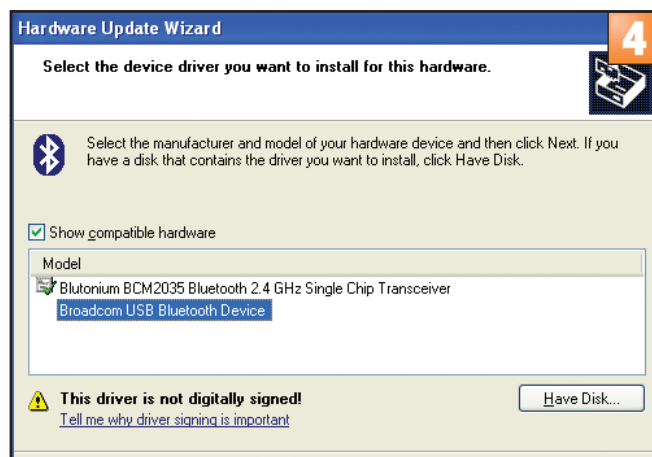
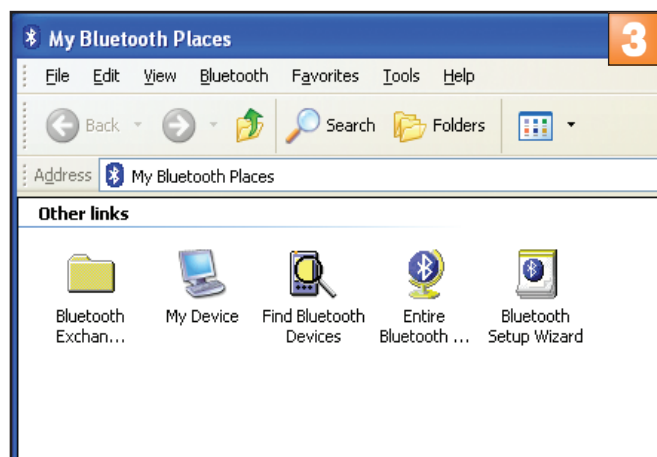
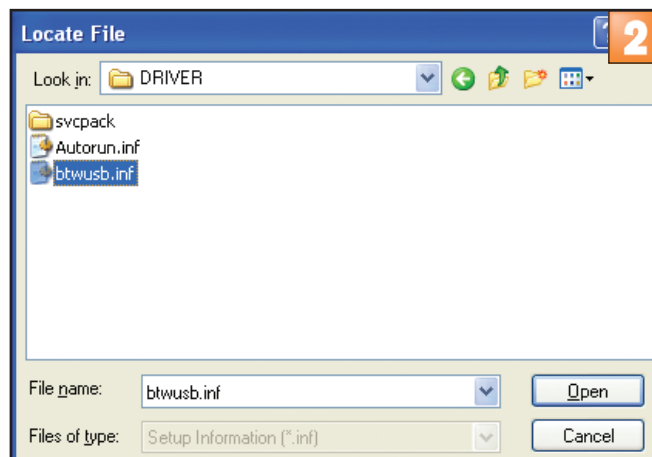
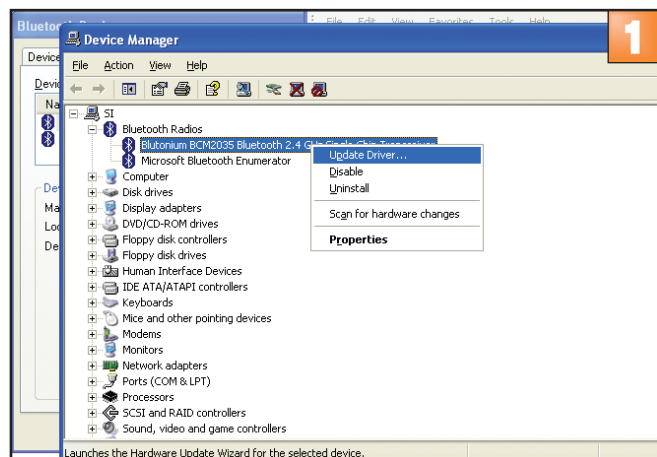
The IVT software looks interesting but isn't as intuitive as some others



Widcomm's software shows a comprehensive list of services that it provides



HOW TO... Switch drivers



Windows XP with SP2 will try to control your Bluetooth devices using its own built-in stack. This may work fine for some, but there are a wider range of features available with certain alternatives. Here's how to switch Bluetooth stacks and prevent Windows' own stack trying to regain control, even after it's been relegated.

1 Open the Control Panel and double-click the System icon. Click the Hardware tab and press the Device Manager button. Locate the Bluetooth Devices icon near the top of

the list and double-click it. Right-click the icon for the adaptor and choose Update Driver.

2 Select the Install option from a list or specific location, then click the 'Don't search' option that follows. Browse to the folder on the driver CD that came with your adaptor and choose the adaptor's .inf driver file.

3 View the CD's contents in Windows Explorer and run the setup program. This will install features such as the highly

useful My Bluetooth Places, which isn't provided by Microsoft. Restart the PC and everything should work.

4 If the new Bluetooth icon in the Notification area reports that there are no Bluetooth devices, it's likely that the Microsoft driver has taken over again. Repeat Step 1, but rather than browsing for the new driver simply choose it from the list provided. In our case, it is the one called Broadcom USB Bluetooth Device. The Blutonium option is Microsoft's driver.

MAKE A CHOICE

When you are preparing to buy a new Bluetooth device, you may be able to find out what stack it comes with. For example, if you search Google for 'trust us bluetooth adaptor' you'll discover links to sites that contain more technical information than the manufacturers usually advertise. In this example, you'll find a link to a *Shopper* review reprinted on Trust's website, which reports that Trust's BT180 Bluetooth adaptor comes with Widcomm drivers.



▲ Trust's BT180 Bluetooth adaptor comes with Widcomm drivers

Widcomm is one of the most popular stacks and is the one preferred by Nick Hunn, chief technology officer at Ezurio Ltd, a Bluetooth development company that used to be part of TDK. "The Widcomm stack is very robust. Most of the bugs have been worked out and it's the most stable today," he said. "However, if all you want to do is connect to a phone to transfer files, or use a printer, use the Microsoft stack."

Sometimes Windows can make the decision for you, and you will want to change to an alternative stack. See our 'How To... Switch Drivers' box above.

TROUBLESHOOTING

Although Bluetooth is a standard, hardware manufacturers customise the driver software to work with their devices. With so many devices and stacks, you might lose hope of finding two or more that will work together. There are a few things you can check, though.

First, ensure that the devices you want to connect support the same profile. For example, if you want to connect a mobile phone to a laptop to dial up the internet, you'd need the phone's Bluetooth system to support the Dial-Up Networking (DUN) profile. The Bluetooth adaptor

in the laptop would also have to support the DUN profile. When buying Bluetooth devices, particularly adaptors, check the supported profiles on the manufacturer's website to ensure that it does what you need it to.

If the devices both support the profile you need but they can't connect, make sure that Bluetooth is turned on. It's not always obvious, so check. In most cases, you'll also need to 'pair' the devices so they are authorised to talk to each other. We will explain about pairing shortly.

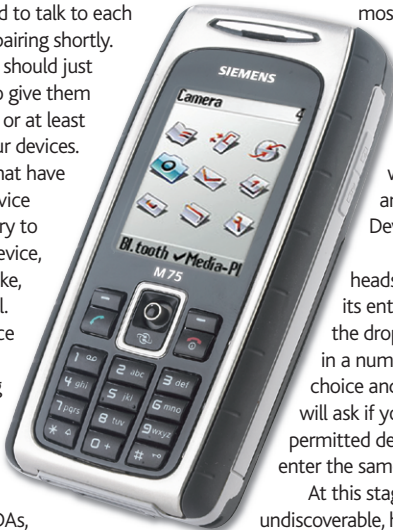
While Bluetooth devices should just work, sometimes you need to give them a shove in the right direction, or at least be aware of the foibles of your devices. For example, some gadgets that have Bluetooth built in put the service to sleep after a while. If you try to connect to it from another device, such as a PC, it might not wake, causing the connection to fail. You can often wake the service by attempting to initiate a connection from the sleeping device. Then try connecting again using the PC.

Certain phones may appear to accept Bluetooth connections from PCs and PDAs, only to drop them again. This is because certain models, including Symbian-based devices and some Pocket PCs, are programmed to make connections rather than receive them. They will drop a connection and attempt to re-establish it themselves, causing a temporary glitch. We've found it extremely hard to connect some Windows-

based PDAs to phones, although connecting the phone to the PDA works fine.

HAPPY COUPLE

Before two Bluetooth devices can communicate with each other, they need to establish a relationship, a process called pairing. Although there is a standard way for this to work, companies that make Bluetooth devices can create their own. In



▲ For trouble-free pairing, make your phone 'visible'

most cases, you need to enable an option on at least one device that makes it 'discoverable'. Use the other device, such as your PC, to search for Bluetooth Devices. With Widcomm software, you would open My Bluetooth Places and choose the Find Bluetooth Devices option.

Once your phone, PDA or headset appears in the list, right-click its entry and choose Pair Device from the drop-down list. You'll be asked to type in a numeric code. Enter a PIN of your choice and click OK. The Bluetooth device will ask if you want to add the PC to its list of permitted devices. If you agree, you'll need to enter the same PIN in the device.

At this stage, you can make both devices undiscoverable, hiding them from Bluetooth devices belonging to other people. Because they are paired, they will still be able to communicate with each other and find discoverable devices within range.

BLUETOOTH VIRUSES

Hiding your Bluetooth device stops other people trying to connect to your phone, PC or PDA but,

more importantly, you are less at risk of Bluetooth viruses. There are currently a small number of viruses, including Commwarrior, that target Symbian devices.

At the moment Bluetooth viruses need you to install them, much in the same way that older Windows viruses needed you to run an email attachment before they could infect the PC. More advanced Windows viruses no longer need your permission so there's no guarantee that Bluetooth viruses will remain this easy to avoid. If you leave your device in discoverable mode, here's what can happen.

First of all, a device that is infected with Commwarrior will scan for discoverable Bluetooth devices and send your gadget a message, asking you to install it. If you reply 'No', it will ask again. If you are near a few infected devices you will be inundated by requests and you may not be able to put your phone into undiscoverable mode without moving to a different place, out of range.

If you click 'Yes' you will stop receiving the annoying messages, but your phone will start attempting to send infected messages by Bluetooth and, expensively, by MMS. Make your phone undiscoverable now, before you encounter a problem, and you can avoid the current virus threat.

VERDICT

Using Bluetooth is not always straightforward, but knowing a little about the underlying services and drivers can help when trying to get devices to communicate with each other. There are too many devices in existence, all subtly different, for you to be sure that a certain combination will work. Still, you are now less likely to fall foul of incompatibility issues. **CS**

WHAT ARE PROFILES?

Profiles are the services that Bluetooth devices can use and provide. A device might be able to collect a file from another device using the File Transfer Profile (FTP), in which case it supports FTP as a client. If it can accept connections from other devices as well as have files sent to it then it would also support FTP as a server. Note that in Bluetooth

terminology, FTP does not stand for file transfer protocol, which is a standard internet protocol.

Not every device supports the same profiles, and neither does every stack. If you used the Microsoft stack with a device that supports the Audio Gateway (AG) profile, you'd be disappointed. To get it to work you'd need a stack that supports AG, as

well as another AG-compatible device to make the connection.

In our table below we've listed the most common stacks alongside the profiles they support. Some profiles overlap; if a stack doesn't have support for the Hardcopy Cable Replacement Profile (HCRP) but does support the Basic Imaging Profile (BIP), it might still support Bluetooth printing.

COMMON BLUETOOTH STACKS										
Bluetooth stack			IVT		Microsoft		Toshiba		Widcomm	
PROFILE	DESCRIPTION	EXAMPLE DEVICES	CLIENT	SERVER	CLIENT	SERVER	CLIENT	SERVER	CLIENT	SERVER
AG	Audio Gateway	Hands-free mobile phone headsets	Yes	Yes	No	No	No	No	Yes	Yes
AV	Audio Video	MP3 player streaming audio to car stereo	Yes	Yes	No	No	Yes	Yes	No	No
BIP	Basic Imaging Profile	Sends text messages and images to printer from phone	Yes	Yes	No	No	Yes	Yes	Yes	Yes
DUN	Dial-Up Networking	Mobile phone internet connection	Yes	No	Yes	No	Yes	No	Yes	Yes
FAX	Fax	PC sends faxes via mobile phone	No	No	No	No	Yes	Yes	Yes	Yes
FTP	File Transfer Profile	Copies files between PCs, phones and PDAs	Yes	Yes	No	No	Yes	Yes	Yes	Yes
HCRP	Hardcopy Cable Replacement Profile	Printers, printer servers	Yes	No	Yes	No	Yes	No	Yes	No
HID	Human Interface Device	Mice and keyboards	Yes	No	Yes	No	Yes	No	Yes	No
HSP	Headset Profile	Hands-free mobile phone headsets	No	No	No	No	Yes	No	Yes	Yes
LAP	LAN Access Profile	Older networking standard, replaced by PAN	Yes	Yes	No	No	Yes	Yes	No	No
OPP	Object Push Profile	Sends a single file from one device to another	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PAN	Personal Area Network	Network connection between PDAs and desktop PCs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SPP	Serial Port Profile	Serial cable emulation, the basis of many other profiles	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SYNC	Synchronisation	PDA synchronisation	Yes	Yes	No	No	No	No	Yes	Yes